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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Mark Banister

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HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE, SUITE 140
TUCSON, AZ 85718

EXAMINER

FREAY, CHARLES GRANT

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

03/05/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/786,718	Applicant(s) BANISTER, MARK	
	Examiner Charles G. Freay	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) 8-14, 16, 18 and 27-57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 15, 17 and 19-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/2004, 1/2005, 10/2005, 10/2006, 12/2006, 3/2007, 10/2007, 12/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of the species of Figs. 1 and 4 in the first species set and the species of electro-activated polymer gels activated indirectly in species set 2 in the replies filed on October 9, 2007 and December 17, 2007 is acknowledged.

In the election of 12/17/07 the applicant noted that claims 1-10, 12-15, 17, 19-26 and 34-41 read on the elected invention. After further review the examiner finds that claims 8-10 and 12 read on the embodiment of Figs. 5 and 6, claims 34-41 read on the embodiment of optically actuated polymer gels, and claims 13 and 14 read on the embodiment of Fig. 7. Therefore, the examiner is withdrawing these claims as non-elected. The claims which are elected for prosecution are claims 1-7, 15, 17, and 19-26.

Information Disclosure Statement

The information disclosure statement filed October 3, 2005 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the

information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Drawings

The drawings are objected to because the reference numeral 32, in Fig. 9, points to the interface between the electrolyte (28) and the pump chamber (14). However, as set forth at the end of the paragraph beginning "Figure 9 illustrates..." on page 19, in the last line the semi-permeable membrane 32 is set forth as surrounding the actuator 12. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 recites the limitation "the physical properties" in line 1. There is insufficient antecedent basis for this limitation in the claim.

The examiner believes claim 7 should depend from claim 6 for proper antecedent basis.

Claim 26 recites the limitation "the electrical circuit" in line 2. There is insufficient antecedent basis for this limitation in the claim.

The examiner believes claim 26 should depend from claim 25 to provide correct antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Culp (USPN 5,192,197).

Culp ('197) discloses a pump for moving fluid having an actuator housing (22 in Fig. 6) having a chamber (18) with ports (24,26) for accommodating the flow of fluid therethrough. There are a plurality of individual actuators (6 in Fig. 5) located in the chamber which form plural chambers (20) that house the fluid in flow connection. There is an activator including a controller which is responsive to sensors (40) for providing measurement of flow conditions. The activator/controller is a programmable (36,38) microprocessor for controlling the actuation at a predetermined time and rate.

Claims 1, 3, 4 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by da Costa (USPN 6,004,115).

Da Costa discloses a pump for moving fluid having an actuator housing (13) having a chamber (14, 15) with ports (11, 12) for accommodating the flow of fluid therethrough. There are a plurality of individual actuators (20) located in the chamber which form plural chambers (20) that house the fluid in flow connection. There is an

activator including a controller (see the first full paragraph of col. 5) for controlling the actuation at a predetermined time and rate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Culp or da Costa.

As set forth above Culp and da Costa discloses the invention substantially as claimed but does not state that the actuators are essentially inert and non-reactive with the fluid, or set forth that the actuator material is a piezoelectric polymer or a piezoelectric ceramic. Culp and da Costa each disclose a piezoelectric actuator. The examiner gives official notice that piezoelectric polymers and piezoelectric ceramics are

well known piezoelectric actuator materials and that it would have been obvious to one of ordinary skill in the art at the time of the invention to use one of these materials as the piezoelectric actuator of Culp or da Costa.

With regards to claim 17 neither of the Culp or da Costa references discuss the actuator being essentially inert and non-reactive with the fluid. No mention is made of the reactivity or non-reactivity of the actuator with the fluid. However, this would be as expected for the vast majority of pumping arrangements. One of ordinary skill in the art would understand that the purpose of pumping is to move fluid from one location to another and it would be obvious that to do so without altering the fluid in any manner would be advantageous and expected. In each of the above references the actuators are of the same material as set forth in the instant invention and one of ordinary skill would find it obvious to make the actuator essentially inert and non-reactive with the fluid pumped so that a desired fluid can be delivered to its destination in its desired form.

Claims 19-21 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Culp or da Costa in view of Chinn et al (USPN 6,685,442).

Each of Culp and da Costa disclose the invention substantially as claimed but do not set forth that the actuator material is an electroactuated polymer gel, encased in an essentially inert material which is semi-permeable to electrolytes, the encasing material being non-permeable or the actuators being electrically shielded from a contiguous actuator. Chinn et al discloses an actuator, which may be used as a pump (col. 2 line 2)

Art Unit: 3746

and includes an electro-actuated polymer gel housed in a non-conductive housing. The gel 10 is encased in a housing 20 which is chemically inert, the gel is encased within the housing by a member 24 which is semi-permeable to the electrolyte . This structure is also encased with a sealed conformal coating. Note especially the disclosure from col. 5 line 55 to col. 6 line 36. At the time of the invention it would have been obvious to one of ordinary skill in the art to substitute the actuator of Chinn et al for either of the actuators of Culp or da Costa since such an substitution would result in a miniature fluid device that is actuated with low electrical potentials and has significant performance characteristics (see col. 1 lines 30-35 and col. 2 lines 17-28).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Majewski et al disclose a piezoelectric pump with a controlled drive arrangement.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles G. Freay whose telephone number is 571-272-4827. The examiner can normally be reached on Monday through Friday 8:30 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3746

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/
Primary Examiner, Art Unit 3746

CGF
February 28, 2008